

Label-Free Detection of DNA via Surface-Enhanced Raman Spectroscopy Using Au@Ag Nanoparticles

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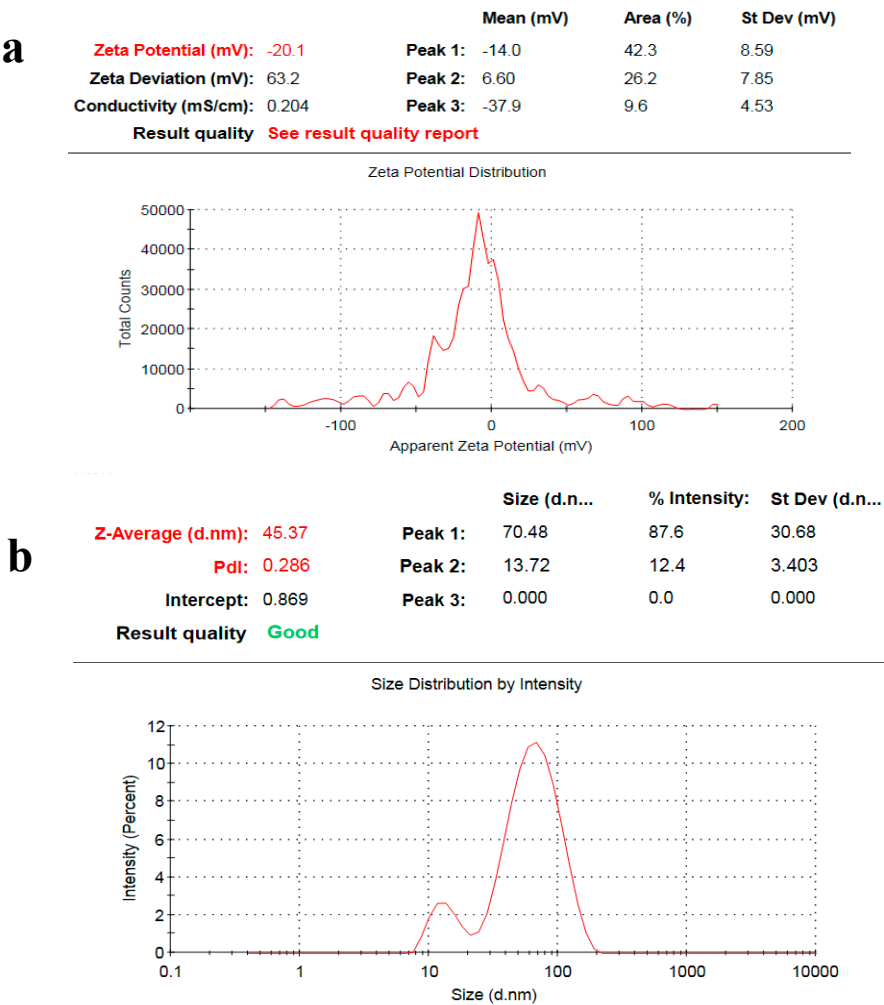


Figure S1. (a)The Zeta potential of Au@AgNPs; (b) The DLS data of Au@AgNPs.

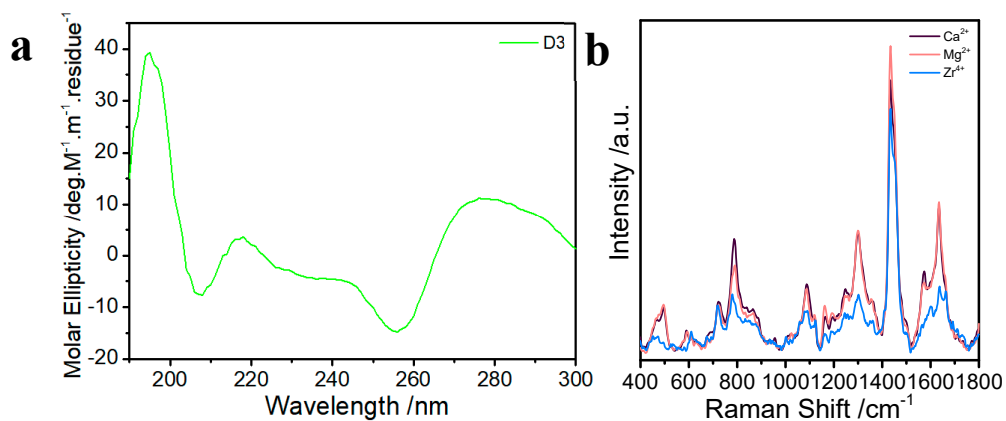


Figure S2. (a) CD spectra of the D3; (b) The D3 SERS spectrum of Au@AgICNPs (Brown line), Au@AgIMNPs (red line) and Au@AgIZNPs (blue line).

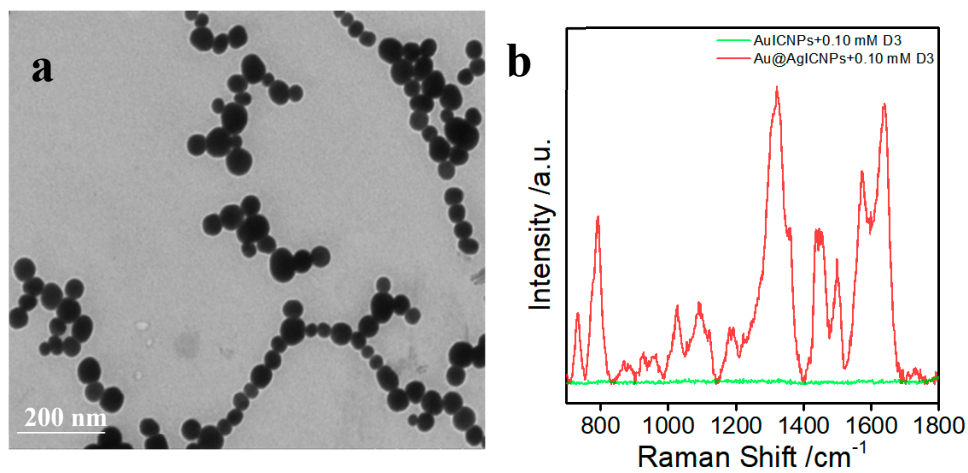


Figure S3. (a) The TEM of pure AuNPs; (b) The D3 SERS spectrum of AuICNPs with 0.1 mM D3 (green line) and Au@AgICNPs with 0.1 mM D3 (red line).

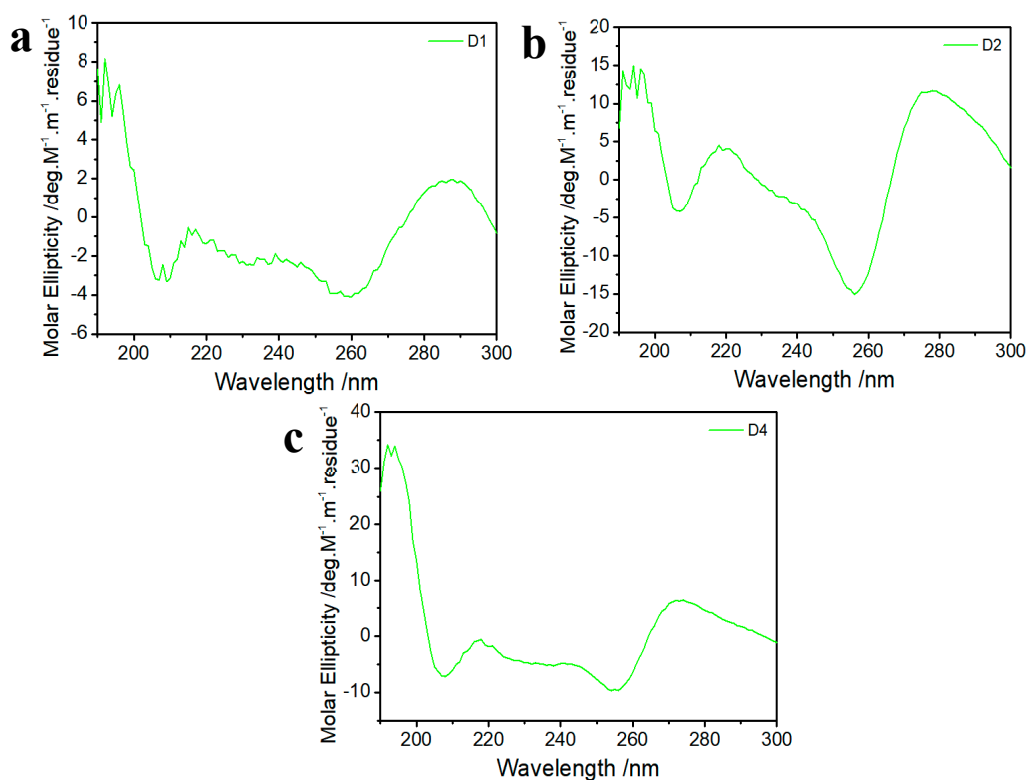


Figure S4. (a) The CD spectra of the D1; (b) The CD spectra of the D2; (c) The CD spectra of the D4.

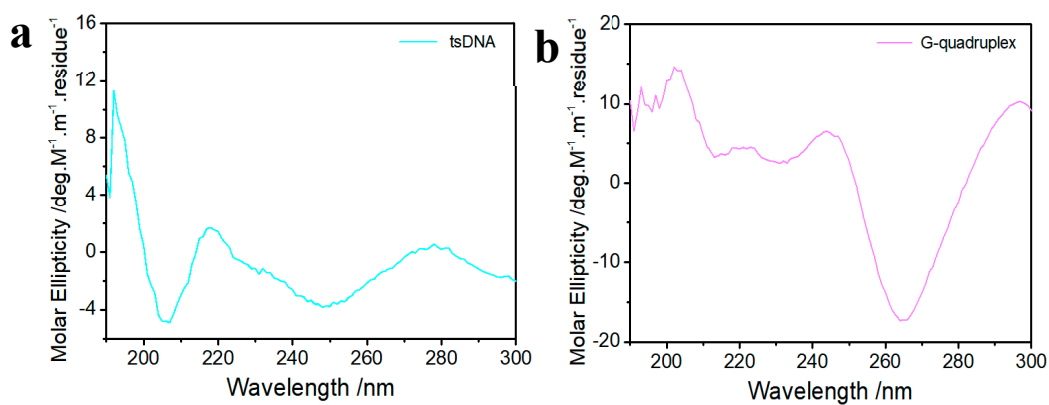


Figure S5. (a) The CD spectra of the tsDNA; (b) The CD spectra of the G-quadruplex.

Table S1. The characteristic peak positions of DNA of different structures.

Raman Shift		dsDNA	tsDNA
733 cm ⁻¹	736 cm ⁻¹	dA ring br	dA ring br
789 cm ⁻¹	795 cm ⁻¹	vs OPO; dC ring br	vs OPO; dT ring br
868 cm ⁻¹	-	v OPO, bk	-
962 cm ⁻¹	-	d, dG δ R5	-
1028 cm ⁻¹	1033 cm ⁻¹	d (v C-O)	d (v C-O)
1093 cm ⁻¹	1094 cm ⁻¹	vs PO ₂ ⁻ , bk	vs PO ₂ ⁻ , bk
1323 cm ⁻¹	1322 cm ⁻¹	dG v(C-N) δ(C8-H)	dG v(C-N) δ(C8-H)
1360 cm ⁻¹	-	dG C2'-endo/ <i>syn</i>	-
1637 cm ⁻¹	1632 cm ⁻¹	dT, dC v C5=C6	dT v C5=C6

Raman Shift		dsDNA	G-quadruplex
733 cm ⁻¹	713 cm ⁻¹	dA ring br	dA ring br
789 cm ⁻¹	789 cm ⁻¹	vs OPO; dC ring br	vs OPO; dT ring br
868 cm ⁻¹	-	v OPO, bk	-
962 cm ⁻¹	-	d, dG δ R5	-
1028 cm ⁻¹	-	d (v C-O)	-
1093 cm ⁻¹	1087 cm ⁻¹	vs PO ₂ ⁻ , bk	vs PO ₂ ⁻ , bk
-	1241 cm ⁻¹	-	dT, dG δ NH(N2)
1323 cm ⁻¹	-	dG v(C-N) δ(C8-H)	-
1360 cm ⁻¹	1358 cm ⁻¹	dG C2'-endo/ <i>syn</i>	dG v(C-N) δ(C8-H) C2'-
1637 cm ⁻¹	1644 cm ⁻¹	dT, dC v C5=C6	endo/ <i>anti</i>
-	1764 cm ⁻¹	-	dT v C5=C6
			dG v C=O (O6 interbase H-bond)

Note: bk=DNA - phosphate backbone, d =deoxyribose, v=stretch, δ=deformation, br =breathe, s =symmetry.

Table S2. The motifs of tsDNA and G-quadruplex detected in the paper.

tsDNA	5'-AGA ₇ GGA-3' 5'-TCT ₇ CCT-3'
G-quadruplex	5'-G ₄ T ₄ G ₄ -3'